We claim:

1.   A method for scheduling a complex activity that uses consumable resources and is governed by a set of pre-defined constraints, wherein an unacceptable schedule exists
5 for the activity, the method comprising the steps of:

establishing   the   unacceptable   schedule   as   a current schedule;

calculating a score for the current schedule;

repairing one or more of the constraint violations
10   of   the   current   schedule   by   modifying   the   current schedule;

determining a revised schedule from the schedule modification or modifications made by the constraint violation repair or repairs;

.15   calculating a score for the revised schedule;

selecting   one   of   the   revised   schedule   or   the current schedule as the new current schedule based upon a comparison of the score of the revised schedule and the score of the current schedule;

20   repeating, until a predetermined condition is met, the   steps   of   repairing   one   or   more   of   the   constraint violations   of   the   current   schedule,   determining   a revised schedule, calculating a score for the revised schedule, and selecting one of the revised schedule or
25   the   current   schedule   as   the   new   current   schedule;   and

selecting   one   of   the   revised   schedules   as   the final schedule.

2.   A   method   as   in   Claim   1,   wherein   the   step   of selecting a new current schedule further comprises the step
30 of selecting as the new current schedule the schedule that has the better score.

3.   A   method   as   in   Claim   1,   wherein   the   step   of selecting a new current schedule further comprises the step of occasionally selecting as the new current schedule the

schedule that has the worse score.

4. A method as in Claim 1, wherein the step of selecting a final schedule further comprises the step of selecting the most recently determined current schedule as 5 the final schedule.

5. A method as in Claim 1, further comprising the step of storing the revised schedule having the best score, and wherein the step of selecting a final schedule further comprises the step of selecting the revised schedule having 10 the best score as the final schedule.

6. A method as in Claim 1, wherein the score is a function of the relative importance of each constraint and the degree of violation of each constraint.

7. A method as in Claim 1, wherein:
15 the score is a function of a multiplicity of penalties and weights;
one penalty is associated with each constraint, each penalty representing the degree of violation, if any, of the constraint; and
20 one weight is associated with each constraint, each weight representing the relative importance of the constraint.

8. A method as in Claim 1, wherein the constraint violations are repaired so that the repaired constraint 25 violation or violations are less severe than before the repair.

9. A method as in Claim 1, wherein the predetermined condition is obtaining a schedule having a score that is better than a predetermined threshold score.

10. A method as in Claim 1, wherein:
the activity is a manufacturing operation; and
the consumable resources are inventory.

11. A method as in Claim 1, wherein:
5   the activity is a maintenance and repair operation; and
the consumable resources are components or materials used to effect the maintenance or repair.

12. A system for scheduling a complex activity that
10 uses consumable resources and is governed by a set of pre-
defined constraints, wherein an unacceptable schedule exists
for the activity, comprising:
a memory device, wherein:
the memory device is capable of storing an
15 unacceptable initial schedule that is supplied to
the system;
the memory device stores information
regarding each of the constraints; and
the memory device is capable of storing one
20 or more revised schedules produced by the system;
and
a processing device, wherein:
the processing device is capable of
calculating a score for each schedule;
25 the processing device is capable of repairing
one or more constraint violations for each
schedule by modifying the schedule;
the processing device is capable of
determining each revised schedule from the
30 schedule modification or modifications made by the
constraint violation repair or repairs;
the processing device is capable of selecting
one of the revised schedule or the current
schedule as the new current schedule based upon a

comparison of the score of the revised schedule
and the score of the current schedule; and

the processing device is capable of selecting
one of the revised schedules as the final schedule
determined by the system.

13. A system as in Claim 12, wherein:

the memory device is capable of storing the
revised schedule having the best score; and

the processing device is capable of selecting the
revised schedule having the best score as the final
schedule.

14. A system as in Claim 12, wherein:

the constraint information stored by the memory
device includes a description of the constraint, a
penalty function, a constraint weight, and a repair
method for the constraint;

the score calculated by the processing device for
each schedule is a function of the penalty caused by
the schedule for each constraint and the weight for
each constraint; and

the repair performed by the processing device for
each constraint violation is performed using the repair
method associated with the constraint.

15. A system as in Claim 12, further comprising a user
input device.

16. A system as in Claim 12, further comprising a
display device.

17. A system as in Claim 12, wherein:

the activity is a manufacturing operation; and
the consumable resources are inventory.

18. A system as in Claim 12, wherein:

the activity is a maintenance and repair operation; and

5 the consumable resources are components or materials used to effect the maintenance or repair.

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